Abstract

System resources are pooled and allocated in an optimal manner to handling telephone voice traffic or to handling computer data traffic. By pooling resources optimal use is made of the available resources. The system is modular and it can be expanded easily and it can meet the needs of a variety of office environments. A combination of mechanisms is used to achieve higher statistical multiplexing on a network interface by dynamically adjusting the multiplexing. The system: 1) Provides homogeneous access to DS0 trunk resource by both voice and data traffic, resulting in a larger resource pool. 2) Partially normalizes the class of service characteristics of data traffic to make it more predictable and can dynamically adjust the bandwidth such that requests for resources can be honored with a higher success rate, and 3) Maintains multiple qualities of service for multiple voice and data streams drawing from a single resource pool.

Data traffic is normalized into flows, each of which has an assigned priority. Bandwidth is allocation to each of the flows. Filtering is performed on lower priority flows if there is not sufficient bandwidth available to handle all the requests for service. The bandwidth of each flow is continuously monitored and the bandwidth allocation is periodically adjusted according to the assigned priority to accommodate the magnitude of the requests for service and the resources available. Voice traffic is also characterized as belonging to prioritized flows, though no filtering or bandwidth adjustment function are applied to voice traffic because voice traffic has a constant bandwidth. Higher statistical multiplexing is achieved by; 1) Combining different classes of service into a single, larger resource pool. 2) Dynamically adjusting both the offered load and the bandwidth available by class of service. 3) Defining multiple {source, destination} multiplexing subgroups with different classes of service, within the larger resource pool, to achieve different multiplexing rates by class of service within the overall system.